

Federico Zullo

Curriculum Vitae

▪ Personal Details

Date and Place of Birth: June 07, 1981, Campobasso (Italy).

Nationality: Italian

E-mail: federico.zullo@unibs.it

▪ Current position

From 12/22/2017: Researcher in Mathematical Physics at the Department of Civil Engineering, Architecture, Land, Environment and of Mathematics, University of Brescia, via Branze 38, 25123, Brescia, Italy.

▪ Education

Ph.D. in Mathematical Physics at the Doctoral School in Mathematics and Physics, Physics Department, Roma TRE University, January 2011.

MSc (Laurea Magistrale) in Physics “cum Laude”, Università “Roma Tre”, September 2005.

BSc (Laurea) in Physics “cum Laude”, Università “Roma Tre”, July 2003

High School Diploma from Liceo Scientifico “A. Romita”, Campobasso, 2000.

▪ Awards, Distinctions and Fellowships.

- Marie Curie INdAM-COFUND Fellowship (2012-2014).
- Winner of the “Premio Galluzzi per la Fisica” (2005).

▪ Research Experience.

PostDoctoral Research:

- ✓ “Incarico occasionale di ricerca” (temporary research grant), Mechanical and Aerospace Engineering, Università of Roma “La Sapienza” July-September 2017.
 - Researches on the extension of thermodynamic functions to non-equilibrium systems.
- ✓ “Incarico occasionale di ricerca” (temporary research grant), Mathematics and Physics Department, Roma Tre University. July 2016.
 - Theory and application of the classical and quantum Backlund transformations to integrable systems.

- ✓ **“Incarico occasionale di ricerca” (temporary research grant), Mathematics and Physics Department, Roma Tre University. From June to August 2015.**
 - Theory and application of the concept of “algebraic entropy” to discrete maps.
- ✓ **“Assegnista di ricerca”, Mathematics and Physics Department, Roma Tre University and INFN, Istituto Nazionale di Fisica Nucleare, Section of Roma Tre. January 2014 - January 2015.**
 - Painlevé equations. Partial results on the Mittag-Leffler expansion for solutions of Painlevé II and IV equations.
 - Classical and quantum Bäcklund transformations. Results on the quantum Ablowitz-Ladik chain and the corresponding Baxter’s Q operator.
- ✓ **Marie Curie INdAM COFUND, School of Mathematics, Statistics and Actuarial Science, University of Kent and Mathematics and Physics Department, Roma Tre University. 2012-2014.**
 - Painlevé equations. Analytical and numerical works show the Mittag-Leffler expansion of solutions of Painlevé I equation, recurrences for the coefficients of the Taylor expansion of the τ function, symmetries of poles of particular solutions.
 - Bäcklund transformations theory applied to integrable systems, ordinary and partial differential equations. Analytical and numerical works show how to obtain exact discretizations of the Toda lattice and Ablowitz-Ladik hierarchy with Bäcklund transformations; how, in simple cases, the Baxter’s operator is linked with the Green’s function of the Schrödinger operator.

Other Academic collaborations

- ✓ **Department of Mechanical Engineering of the University of Roma “La Sapienza”, 2010-present (with Prof. Enrico Sciubba).**
 - Development of population dynamics models on the basis of Thermodynamic principles with applications to sustainability. Construction of exergy-based models of population dynamics: analytical and numerical studies and comparison with experimental data confirm the relevance of Thermodynamics in applications to sustainability issues.
- ✓ **Department of Basic and Applied Sciences for Engineering of the University of Roma “La Sapienza”, 2017-present (with Prof. Sandra Carillo).**
 - Applications of the theory of Backlund transformations to nonlinear ordinary differential equations of second order, in particular to the Emden-Fowler equation and the Ermakov-Pinney equation.

Doctoral Research:

- ✓ **Department of Physics, Roma Tre University, 2007-2011. (research advisor: Prof. Orlando Ragnisco).**
 - Bäcklund transformations theory applied to integrable systems and ordinary differential equations. Analytical and numerical works show how to obtain Bäcklund transformations for Gaudin models and how these transformations discretize the continuous equations.

- **Teaching Experience.**

University courses

- 2018-2019
 - Course “Meccanica Razionale” (Analytical Mechanics), University of Brescia, Department of Civil Engineering, Architecture, Land, Environment and of Mathematics.
 - Course “Probabilità e Statistica” (Probability and Statistics), University of Brescia, Department of Civil Engineering, Architecture, Land, Environment and of Mathematics.

- 2017-2018
Course “Meccanica Razionale” (Analytical Mechanics), University of Brescia, Department of Civil Engineering, Architecture, Land, Environment and of Mathematics.

Course “Probabilità e Statistica” (Probability and Statistics), University of Brescia, Department of Civil Engineering, Architecture, Land, Environment and of Mathematics.
- 2016-2017
Teaching assistant for the course “Meccanica Razionale” (Analytical Mechanics), University of Roma La Sapienza, Department of Basic and Applied Sciences for Engineering
- 2015-2016
Teaching assistant for the graduate course “Complementi di Metodi Matematici della Fisica” (Mathematical methods of Physics) at Roma Tre University, Department of Mathematics and Physics.
- 2014-2015
Teaching assistant for the graduate course “Complementi di Metodi Matematici della Fisica” (Mathematical methods of Physics) at Roma Tre University, Department of Mathematics and Physics.
- 2012-2013:
University of Kent, School of Mathematics, Statistics and Actuarial Sciences, Canterbury (UK), teaching assistant for the course graduate course “Nonlinear Waves” (Spring term).

University of Kent, School of Mathematics, Statistics and Actuarial Sciences, Canterbury (UK), teaching assistant for the undergraduate course “Mathematics in Biology” (Spring term).
- 2011-2012:
Teaching assistant for the graduate course “Complementi di Metodi Matematici della Fisica” (Mathematical methods of Physics) at Roma Tre University, Department of Physics.

Teaching assistant for the undergraduate course “Elementi di Analisi per Ottici, parte A” (Elements of Analysis for Opticists, part A) at Roma Tre University, Department of Physics.
- 2010-2011
Teaching assistant for the graduate course “Complementi di Metodi Matematici della Fisica” (Mathematical methods of Physics) at Roma Tre University, Department of Physics.
- 2009-2010:
Teaching assistant for the graduate course “Complementi di Metodi Matematici della Fisica” (Mathematical methods of Physics) at Roma Tre University, Department of Physics.

Teaching assistant for the undergraduate course “Elementi di Analisi per Ottici, parte A” (Elements of Analysis for Opticists, part A) at Roma Tre University, Department of Physics.

Summer Schools

- 2012-2013: Instructor at the Summer School of Thermodynamics, University of Roma “La Sapienza, Roma, Italy (11 July-23 July 2013).
- 2011-2012: Instructor at the Summer School of Thermodynamics, University of Roma “La Sapienza, Anzio, Italy (24 June-6 July 2013).

Thesis supervisor:

- “Tesi Magistrale” in Physics, academic year 2012-2013, Università Roma Tre (together with two other advisors: A.N.W. Hone and O. Ragnisco).
- “Dissertation” in Mathematics, academic year 2012-2013, University of Kent.

Other teaching experience:

- 2005-2016: Taught as temporary teacher of Mathematics, Science and Physics in different High Schools in Roma.

Workshop organization

- Co-organizer of the workshop “Hamiltonian Systems in finite and infinite dimensions” held at Roma Tre University in the October 2013.
- Organizer of the workshop “Three days on Painlevé equations and their applications” held at Roma Tre University in the December 2014.
- Co-organizer of the mini-symposium “Mathematical modelling in materials with memory and nonlinear phenomena” in MASCOT 2018, 15th Meeting on Applied Scientific Computation and Tools, held at Roma La Sapienza University, October 2018.

Grants, fellowships...

2017: Research fellowship (Incarico occasionale di ricerca) “Modelli di calcolo dell’energia di non-equilibrio in sistemi macroscopici”, Mechanical and Aerospace Engineering Department, La Sapienza University, two months.

2016: Research fellowship (Incarico occasionale di ricerca) “Sistemi integrabili e super integrabili, classici e quantistici, continui e discreti e loro applicazioni”, Mathematics and Physics Department, Roma Tre University, one months.

2015: Research fellowship (Incarico occasionale di ricerca) “Sistemi integrabili e super integrabili, classici e quantistici, continui e discreti e loro applicazioni”, Mathematics and Physics Department, Roma Tre University, three months.

2014: Research Grant (Assegno di ricerca) “Sistemi hamiltoniani integrabili finito- e infinito-dimensionali”, Mathematics and Physics Department, Roma Tre University and INFN, one year.

2012: INdAM (Istituto Nazionale di Alta Matematica) Fellowship in Mathematics for experienced researchers cofunded by Marie Curie actions, two years.

2009: INFN (Italian National Institute of Nuclear Physics) Fellowship for PhD students, two years.

The researches carried out at Roma Tre University from 2008 to 2011 were part of a MIUR (Italian Ministry for University and Research) project, PRIN, national coordinator B. Dubrovin.

Memberships, Collaborations...

- From 2017: Member of the “Seminario Matematico di Brescia”
- 2013-2014: Junior Membership to the I.N.I. (Newton Institute for Mathematical Sciences), Cambridge.
- From January 2009: member of G.N.F.M. (Gruppo Nazionale di Fisica Matematica, Italian National Group of Mathematical Physics).
- 2008-2015: scientific association to I.N.F.N. (Istituto Nazionale di Fisica Nucleare, Italian national institute of nuclear physics).
- From 2006 to 2007: Research Spin Off at E.N.E.A. (Italian Agency for Energy & Environment) for the development of optical fiber bragg grating sensors.

✓ Publications

Research articles

- Ragnisco O., Zullo F.: “Continuous and Discrete (Classical) Heisenberg Spin Chain revised”, *SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)* **3**, 033, (2007).
- Ragnisco O., Zullo F.: “Bäcklund Transformations for the Trigonometric Gaudin Magnet: first results” *SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)* **6**, 012, 6 pages, (2010).
- Ragnisco O., Zullo F.: “Bäcklund transformations as exact integrable time-discretizations for the trigonometric Gaudin model.” *Journal of Physics A: Mathematical and Theoretical*. **43**, 434029, (2010).
- Sciubba E., Zullo F.: Exergy based population dynamics: a thermodynamic view of the sustainability concept, *Journal of Industrial Ecology*, **15**, Issue 2, pp. 172–184, (2011).
- Sciubba E., Zullo F.: Is Sustainability a Thermodynamic concept?, *International Journal of Exergy*, **8**, No.1 pp. 68 – 85 (2011).
- Ragnisco O., Zullo F.: “Bäcklund Transformation for the Kirchhoff Top” *SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)*, **7**, 001, 13 pages, (2011).
- Zullo F.: “Bäcklund Transformation for the elliptic Gaudin model and a Clebsch system”, *Journal of Mathematical Physics*, **52**, 073507 (2011).
- Ragnisco O., Zullo F.: “Quantum Bäcklund Transformation: some ideas and examples”, contribution to the conference *Solitons in 1+1 and 2+1 dimensions, DS, KP and all that*, Lecce, 2011 September 13-14, in *Theoretical and Mathematical Physics*, **172** (2): 1159-1170 (2012).
- Sciubba E., Zullo F.: “An Exergy-Based Model for Population Dynamics: Adaptation, Mutualism, Commensalism and Selective Extinction”, *Sustainability*, **4** (10), 2611-2629, doi:10.3390/su4102611, (2012).
- Sciubba E., Zullo F.: “Stability and periodic solutions in an exergy-based model of population dynamics”, contribution to Proceedings of ECOS 2012, 25th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems June 26-29, 2012, Perugia, Italy. Published in *Energy*, **58**, 1, pp. 202–209, (2013).

- Zullo F.: “Bäcklund transformations and Hamiltonian flows”, *Journal of Physics A: Mathematical and Theoretical*, **46**, 145203, doi:10.1088/1751-8113/46/14/145203, (2013).
- Sciubba E., Zullo F.: “On the Optimal use of shared exergy resources.” contribution to Proceedings of *ECOS 2013*, International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems June 16-19, Guilin, China (2013).
- Hone A.N.W., Ragnisco O., Zullo F.: “Properties of the series solution for Painlevé I” *Journal of Nonlinear Mathematical Physics*, Special Issue “The Geometry of the Painlevé Equations”, **20**, Supplement 1, doi:10.1080/14029251.2013.862436, (2013)
- Zullo F.: “On an integrable discretisation of the Ablowitz-Ladik hierarchy”, *Journal of Mathematical Physics*, **54**, 053515 (2013).
- Sciubba E., Zullo F.: “An Exergy-based analysis of the co-evolution of different species sharing common resources”, *Ecological Modelling*, **273**, pp 277–283, (2014).
- Zullo F.: A q-difference Baxter's operator for the Ablowitz-Ladik chain. *J. Phys. A: Math. Theor.* **48** 125205 doi:10.1088/1751-8113/48/12/125205. (2015)
- Hone A., Ragnisco O., Zullo F.: Algebraic entropy for algebraic maps. Under review for *J. Phys. A: Math. Theor.*
- F. Zullo: “Entropy Production in the Theory of Heat Conduction in Solids”, *Entropy*, **18** (3), 87; doi:10.3390/e18030087, 2016
- Sciubba E., Zullo F: Minimum Exergy Flow of Isolated Populations: Theory and Experiments, *International Journal of Thermodynamics*, Vol. 19 (No. 4), pp. 226-233, 2016, doi: 10.5541/ijot.5000205311.
- Sciubba E. Zullo F: Exergy Dynamics of Systems in Thermal or Concentration Non-Equilibrium, *Entropy* 2017, *19*(6), 263; doi:10.3390/e19060263
- E. Sciubba, F. Zullo: A novel derivation of the time evolution of the entropy for macroscopic systems in thermal non-equilibrium, *Entropy* 2017, *19*(11), 594; doi:10.3390/e19110594
- Hone A.N.W, Zullo F.: A Hirota bilinear equation for Painlevé transcendents PIV, PII and PI, *Random Matrices: Theory and Applications*, Vol. 7, No. 2, (2018) 1840001 (15 pages). doi:10.1142/S2010326318400014
- Carillo S., Zullo F: Ermakov-Pinney and Emden-Fowler equations: new solutions from novel Bäcklund transformations, *Theoretical and Mathematical Physics*, September 2018, Volume 196, Issue 3, pp 1268–1281, doi:10.1134/S0040577918090027. Russian version in *Teoreticheskaya i Matematicheskaya Fizika*, Vol. 196, No. 3, pp. 373–389, 2018.
- Carillo S., Zullo F.: The Gross–Pitaevskii equation: Bäcklund transformations and admitted solutions, in *Ricerche di Matematica*, 2018, doi:10.1007/s11587-018-0422-8.
- Sciubba E., Zullo F.: On the quantification of non-equilibrium exergy for thermodynamic systems evolving according to Cattaneo’s equation, *International Journal of Thermodynamics*, **22** (1), 19-24, 2019, DOI: 10.5541/ijot.515606
- Zullo F.: On the solutions of the Airy equation and their zeros, accepted for publication in *De Gruyter Proceedings in Mathematics*

- E. Sciubba, Zullo F.: A general model for the evolution of non-equilibrium systems, *Energy*, 2019, <https://doi.org/10.1016/j.energy.2019.05.178>
- F. Zullo: On the dynamics of the zeros of solutions of the Airy equation, accepted for publication in *Mathematics and Computers in Simulation*

Proceedings

- Sciubba E., Zullo F: “Stability and periodic solutions in an exergy-based model of population dynamics” Proceedings of the 25th International Conference on Efficiency, Cost, Optimization and Simulation of Energy Conversion Systems and Processes, ECOS 2012. Aabo Akademi University, Vol. 8, p. 179-192 14 p., 2012.
- Sciubba E., Zullo F: “An exergy-based model for population dynamics: cooperative vs. parasitic behavior”, *Proceedings of the ASME 2012 International Mechanical Engineering Congress & Exposition IMECE2012*, November 9-15, 2012, Houston, Texas, USA.
- Sciubba E., Zullo F: “On the optimal use of shared exergy resources” *Proceedings of the 26th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems, ECOS 2013*. China International Conference Center for Science and Technology.
- Sciubba E., Zullo F: “A contribution to the systematic quantification of the resource flow needed to sustain a given population dynamics” *Proceedings of the 27th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems, ECOS 2014*. June 15-19, 2014, Turku, Finland.
- Sciubba E Zullo F: Exergy dynamics of systems in thermal non-equilibrium, *Conference on Energy Systems*, Istanbul 2015, 23-25 December 2015, Yildiz Technical University, ISBN: 978-605-65907 0-2, proceedings available at http://www.ices2015conference.com/ProceedingsCD/ICES2015_Proceedings.pdf
- Sciubba E Zullo F: “Exergy dynamics of a sphere undergoing a non-equilibrium concentration transient”, *29th international conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems* June 19. - 23. 2016, Portorož, Slovenia
- Sciubba E., Zullo F.: Exergy and entropy of non-equilibrium systems, *30th international conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems, July 2-9, 2017, San Diego, CA, USA*
- Sciubba E., Zullo F.: Exergy for systems in thermal non-equilibrium evolving according to Cattaneo’s equation. *31th international conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact of Energy Systems*, June 17-21 2018, Guimaraes, Portugal.

Popular Science articles.

- F. Zullo: “Solitoni e fibre ottiche” in “Quaderni di scienza e scienziati molisani” n. 1, Settembre 2006.
- F. Zullo: “Una nuova generazione di sensori” in “Quaderni di scienza e scienziati molisani” n. 2, Marzo 2007.

- F. Zullo: “Sull’utilità del concetto di varietà in fisica” in “Quaderni di scienza e scienziati molisani” n. 3 Settembre 2007.
- F. Zullo: “L’equazione di Korteweg – de Vries” in “Quaderni di scienza e scienziati molisani” n. 4 Marzo 2008.
- F. Zullo: “Matematica, teoria dei gruppi e realtà fisica” in “Quaderni di scienza e scienziati molisani” n. 5 Settembre 2008.
- F. Zullo: “Uno sguardo alla teoria del caos: come si fanno le previsioni del tempo?” in “Quaderni di scienza e scienziati molisani” n. 6 Marzo 2009.
- F. Zullo: “Sostenibilità, Exergia e modelli di Lotka-Volterra” in “Quaderni di scienza e scienziati molisani” n. 8 Marzo 2010.
- F. Zullo: “Dimensioni, frattali e traiettorie quantistiche” in “Quaderni di scienza e scienziati molisani” n. 9 Settembre 2010.
- F. Zullo: “Sulle trasformazioni di Bianchi Bäcklund” in “Quaderni di scienza e scienziati molisani” n. 10 marzo 2011.
- F. Zullo: “Teoria di Hamilton-Jacobi, trasformazioni di Bianchi-Bäcklund e meccanica quantistica” n 12, Marzo 2012.
- F. Zullo: “Un viaggio tra le funzioni di Weierstrass e Painlevé. I.” in “Quaderni di scienza e scienziati molisani” n 14, Marzo 2013.
- F. Zullo: “Un viaggio tra le funzioni di Weierstrass e Painlevé. II.” in “Quaderni di scienza e scienziati molisani” n 15, Settembre 2013.
- F. Zullo: “Dall’analisi matematica alla geometria attraverso ricorrenze numeriche” in “Quaderni di scienza e scienziati molisani” 17-18, Settembre 2014.
- F. Zullo: Sulla produzione di entropia nei sistemi fisici, in “Quaderni di scienza e scienziati molisani”, 2017

✓ Main Workshops, Conferences, Invited Talks...

- 19/02/2009-21/02/2009 Workshop *Nonlinear Waves and Integrable Systems*, Physics Department, Roma Tre University, Roma Tre (Italy).
- From 14/09/09 to 19/09/09: XXXIV Summer School of Mathematical Physics, Ravello, Italy.
- From 01/10/09 to 03/10/09: National Meeting of the Italian Group of Mathematical Physics (GNFM), Montecatini Terme, Italy. Talk “*Bäcklund Transformations for the trigonometric Gaudin model*”.
- From 17/06/2010 to 19/06/2010: XIXth International Colloquium on Integrable Systems and Quantum symmetries, Prague, Czech Republic, Plenary talk “*An exact time discretization for the partially anisotropic Clebsh system via Bäcklund transformation for the trigonometric Gaudin Model*”.
- From 19/07/2010 to 23/07/2010 “London Mathematical Society and EPSRC Short Instructional Course on Classical & Quantum Integrable Models”, Canterbury, University of Kent.

- 21/10/2010: Invited talk "*Bäcklund transformations for the elliptic Gaudin magnet*", University of "Milano-Bicocca", Department of Mathematics, Milano Italy.
- From 18/07/2011 to 22/07/2011: Workshop *Discrete Integrable Systems*, Leiden, Holland, Lorentz Center. Talk: "*Bäcklund transformation and time-discretizations for the elliptic Gaudin Model*".
- From 26/07/2011 to 29/07/2011: Conference *Finite Dimensional Integrable Systems in Geometry and Mathematical Physics*, Jena, Germany. Talk: "*Separation of variables, Bäcklund transformations and "spectrality property" for finite dimensional integrable systems*".
- From 27/09/2011 to 01/10/2011: *Bi-Hamiltonian Systems and All That*, Conference in honour of Franco Magri's 65th birthday, University of "Milano-Bicocca", Department of Mathematics, Milano Italy. Talk: "*Exact time discretisations via Bäcklund transformations: general ideas and examples*".
- 15/12/2011: Invited talk "*Exergy-driven population dynamics*", Dep. of Electronic Engineering, Dep. of Physics & INFN (Italian National Institute of Nuclear Physics), Roma Tre University.
- From 16/04/2012 to 19/04/2012: British Mathematical Colloquium & Mathematical Physical Workshop, University of Kent, Canterbury, Kent.
- From 10/07/2012 to 15/07/2012: *Euroscience Open Forum & Marie Curie Actions Conference*, Dublin, Ireland.
- From 4/10/2012 to 6/10/2012: National Meeting of the Italian Group of Mathematical Physics (GNFM), Montecatini Terme, Italy. Talk "*Bäcklund transformations and hamiltonian flows.*"
- 12/10/2012: Invited talk: "*Bäcklund Transformations and exact discretization, some ideas and an example*", University of Leeds, Faculty of Mathematics and Physical Sciences, Leeds (UK).
- From 3/12/2012 to 7/12/2012: Conference "Algebraic Structures in Integrable Systems", Moscow (Russia). Poster "*Properties of the series solution for Painlevé P*".
- From 6/02/2013 to 8/02/2013: Conference "Nonlinear Waves and Integrable Systems", Trieste, SISSA (Italy). Talk "*Bäcklund transformations and exact discretisation: a Hamiltonian perspective*".
- From 15/03/2013 to 16/03/2013: Workshop "Integrable Algorithms: New Frontiers in Numerical Analysis" University of Leeds, Faculty of Mathematics and Physical Sciences, Leeds (UK).
- From 12/06/2013 to 15/06/2013: "Third International Conference Nonlinear Waves, Theory and Applications", Beijing (China). Invited talk: "*Hamiltonian flows from Bäcklund Transformations: an application to the Ablowitz-Ladik hierarchy.*"
- From 8/07/2013 to 12/07/2013: "Discrete Integrable Systems - A Follow-up Meeting", Cambridge (UK), Isaac Newton Institute for Mathematical Sciences.
- From 24/10/2013 to 25/10/2013: "Hamiltonian Systems in finite and infinite dimensions", Roma, Roma Tre University, Math. And Phys. Dept., Talk: "*Properties of series solution for Painlevé P*".
- From 18/11/2013 to 21/11/2013: research visitor at SISSA (Scuola Internazionale Superiore di Studi Avanzati), Trieste. Invited talk: "*Properties of series solution for Painlevé I and beyond*".

- From 15/05/2014 to 17/05/2014: National Meeting of the Italian Group of Mathematical Physics (GNFM), Montecatini Terme, Italy. Talk “*Alcune proprietà delle soluzioni delle equazioni di Painlevé*”
- From 18 to 20 June 2014: “Geometric and Analytic Aspects of Integrable and nearly-Integrable Hamiltonian Systems” Milano-Bicocca University. Talk: *Properties of the series solutions for Painlevé transcendent*.
- From 14 to 18 July 2014: XXXth International Colloquium on Group Theoretical Methods in Physics, Ghent University, Belgium. Talk: *Properties of the series solutions for Painlevé transcendents: from P_{IV} to P_I through P_{XXXIV}* .
- From 1 to 5 September 2014: “Recent Advances in Quantum Integrable Systems 2014”, Institut de Mathématiques de Bourgogne, Dijon, France. Talk: “*A q-difference Baxter's operator, Backlund transformations and the Ablowitz-Ladik chain*”.
- From 18 to 19 September 2014: “Integrable systems and all that”, Dipartimento di Matematica e Fisica E. De Giorgi, Università del Salento. Talk: “*Baxter's operator and quantum Backlund transformations for the Ablowitz-Ladik chain*”.
- From 18 to 20 December 2014: “Three days on Painlevé equations and their applications”, Dipartimento di matematica e Fisica, Università Roma Tre. *Introductory talk to the discussion*.
- From 13 to 17 February 2017: Asymptotic and computational aspects of complex differential equations, Pisa, Italy. With the support of the Centre de recherches mathématiques Université de Montréal. Invited speaker.
- From 25 May to 27 May, 2017: Continuum physics: a “rational” approach, in celebration of Angelo Morro's 70th birthday and in honour of his contributions to continuum physics, Brescia, Italy. Invited speaker
- From 2 to 6 July, 2018: congress of the Italian Society of Applied and Industrial Mathematics (SIMAI). Talk: *Properties and applications of Backlund transformations to a class of nonlinear ODES*.
- From 10 to 15 of September 2018: Complex Differential and Difference Equations, CDDE 2018, Będlewo, Poland. Talk: *On the solutions of the Airy equation*
- From 2 to 5 October 2018: MASCOT 2018, 15th Meeting on Applied Scientific Computation and Tools. Talk: *On the zeros of entire functions*.
- From 20 to 24 May 2019: International Conference on Elliptic and Parabolic Problems, Gaeta, Italy. Talk: *On the optimization of heat rectification in graded materials*.